

glandular hairs: petioles mostly attached midway of the ocreae: ocreae mostly sharply acute and densely hairy: panicles narrowly cylindrical and averaging somewhat longer than the type, the long-styled with a somewhat greater percentage of fertility than is usually found in the type; pollen of short-styled flowers mostly normal.

Persicaria pratincola Greene, Leaflets. i. 36 (1904). *P. spectabilis* Greene and *P. aboriginum* Greene, loc. cit. 37-44, and probably others of Greene's species of which types are not available. Indiana to the Dakotas, south to Texas and Mexico, in swamps or sand.

The following are referred here. INDIANA: Gibson, *Lansing*, no. 2831. WISCONSIN: Lapham. ILLINOIS: sand-dunes, Havana, August 12, 1893, *Gleason*. MINNESOTA: Lindstrom, Chicago Co., August, 1892, *Taylor*; near Moorhead, Red River Valley, *Ballard*, no. 2951. MISSOURI: low sandy bottoms, common, Jackson Co., *Bush*, no. 328; low prairie, Dodson, *Bush*, no. 4150; rich bottom, Sibley, *Bush*, no. 4176. NORTH DAKOTA: swamps, Leeds, August 7, 1899, *J. Lunell*; Fort Pembina, 1876, *Havard*. SOUTH DAKOTA: vicinity of Brookings, July 12, 1891, *Williams*. NEBRASKA: 3 miles northeast of Whitman, in dry lake, *Rydberg*, no. 1613; Kennedy, August 20, 1910, *Bates*. OKLAHOMA: Perkins, Payne Co., August 28, 1895, *J. W. Blankinship*; edge of pond, Copan, Washington Co., *Stevens*, no. 2104; Arkansas River, Creek Nation, August 22, 1895, *J. H. Kimmons*. TEXAS: *Wright*. MEXICO: Oaxaca, *Deam*, no. 16; Toluca, *Holway*, no. 3173.

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BIDENS HYPERBOREA AND ITS VARIETIES.

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SIMILAR to *Bidens Eatoni* Fernald in its habitat, but more northern in its range, is *B. hyperborea* Greene. This species is confined to estuaries from James Bay to northeastern Massachusetts. *B. Eatoni* has been found only on the mouths of the larger rivers: the Hudson, the Quinnipiac, the Taunton, the Merrimac, and the Kennebec with its near neighbor the Sheepscot. *B. hyperborea*, on the other hand, is to be expected on the tidal shores of almost every fair-sized stream from the Merrimac to the St. Lawrence River, except in the Bay of Fundy and on the Atlantic coast of Nova Scotia.

Bidens hyperborea belongs to a group of three species which are characterized by having simple leaves and achenes with a convex cartilaginous summit. The characters pointed out by Professor Fernald in RHODORA xxiv. 206 (1922), differentiating this species

from *B. laevis* and *B. cernua*, prove, when applied to subsequent collections, to be constant, with one exception. *B. hyperborea* is described as having the disk-corollas 4-toothed; 4- and 5-toothed corollas may be found in one head.

Comparatively few botanists have collected this species, and a complete knowledge of all of its phases cannot be gained until fuller collections have been made. With the exception of a few specimens taken on the estuary of the Miramichi River, by Professors M. L. Fernald and A. S. Pease, the only material from New Brunswick available to the writer was collected by Mr. H. K. Svenson and himself in August, 1923, which was too early for mature plants. The New Brunswick plant is here tentatively referred to the same variety which is found on the St. Lawrence River estuary; future collections may demonstrate the incorrectness of this disposition. Some of the plants collected on the St. Lawrence estuary by Svenson & Fassett appear different from those collected by Brother Victorin the previous year, but for the present these plants are all treated as one variety.

Bidens hyperborea breaks up into the following varieties:

- a. Outer achenes 4–5 mm. long; the inner 5–7 mm. long, with marginal awns 1.8–3 mm. long *b*
- b*. Plant simple and monocephalous: leaves oblanceolate and blunt, entire or obscurely toothed.....var. *typica*.
- b*. Stem somewhat branching: leaves distinctly serrate....var. *colpophila*.
- a. Outer achenes 6–8.5 mm. long; the inner 7.5–10 mm. long, with marginal awns 3–5 mm. long *c*
- c*. Branches ascending, making an angle with the stem of less than 45° *d*
- d*. Outer involucre bracts mostly linear, acute, rarely exceeding 2 mm. in width: leaves narrowly lanceolate, long attenuate, with 2–8 pairs of fine teeth seldom more than 0.5 mm. broad at base.....var. *cathancensis*.
- d*. Outer involucre bracts lanceolate, rarely linear, often obtuse, exceeding 2 mm. in width: leaves lanceolate, not very attenuate, with 1–5 pairs of coarse teeth 1 mm. or more broad at base.....var. *laurentiana*.
- c*. Branches spreading, making an angle with the stem of more than 45° *e*
- e*. Primary leaves with 0–3 pairs of teeth *f*
- f*. Leaves thin, with (1–)2–3 pairs of teeth: outer involucre bracts with 1, rarely 2, pairs of teeth; inner bracts broadly oblong, 3–4 mm. wide.....var. *Svensoni*.
- f*. Leaves fleshy, with 0–2 pairs of teeth: outer involucre bracts entire or rarely with 1 pair of teeth; inner bracts narrowly oblong, 2–3 mm. wide.....var. *gaspensis*.
- e*. Primary leaves with 4–6 pairs of teeth.....var. *arcuans*.

B. HYPERBOREA, var. *typica*. *B. hyperborea* Greene, Pittonia iv. 257 (1901). Known only from the original collection at Rupert House, James Bay, September 5, 1885, *J. M. Macoun*, no. 12056.

This, the only estuarine plant known from a river entering Hudson Bay, may indicate that many species having affinities with the more southern estuaries should be sought in this region.

B. HYPERBOREA, var. *COLPOPHILA* (Fernald & St. John) Fernald, *RHODORA* xx. 149 (1918). Estuaries from Northumberland Strait to northern Massachusetts. This is the most wide-spread of the known varieties of *B. hyperborea*, and shows many local variations in shape of involucre bracts, number of awns, tothing of leaves, and habit.—NEW BRUNSWICK: tidal mud of the Buctouche River, Coate Mills, August 20, 1923, *Svenson & Fassett*, no. 879; tidal shores, Shediac River, Shediac, August 23, 1924, *N. C. Fassett*, no. 2115. NOVA SCOTIA: tidal mudflats of River Philip, Oxford, August 24, 1924, *N. C. Fassett*, no. 2103. MAINE: tidal shores of Pleasant River, Columbia Falls, August 17, 1924, *N. C. Fassett*, nos. 2107 and 2109; Columbia Falls, August 20, 1924, *N. C. Fassett*, nos. 2102 and 2108; Columbia Falls, August 23, 1923, *Svenson & Fassett*, nos. 797 and 847; tidal shores of the Narraguagus River, Cherryfield, August 28, 1923, *Svenson & Fassett*, no. 878; Cherryfield, August 17, 1924, *N. C. Fassett*, no. 2131; tidal shores of the Harrington River, Harrington, August 17, 1924, *N. C. Fassett*; tidal shores of the Union River, Ellsworth, August 29, 1923, *Svenson & Fassett*, no. 848; Ellsworth, August 17, 1924, *N. C. Fassett*, nos. 2111 and 2112; tidal mudflats of the Penobscot River, Bangor, September 7, 1916, *Fernald & Long*, nos. 14829 and 14830; very abundant on muddy and gravelly tidal flats of the Penobscot River, Hampden, September 8, 1916, *Fernald & Long* in *Pl. Exsicc. Gray*, no. 296; tidal mudflats at mouth of Souadabscook Stream, Hampden, September 11, 1916, *Fernald & Long*, nos. 14833 and 14834; tidal mudflats at the mouth of Reed Brook, Hampden, September 8, 1916, *Fernald & Long*, nos. 14831 and 14832; tidal flats of the Sheepscot River, Alna, August 14, 1922, *N. C. Fassett*, no. 292; borders of salt marsh, Back River Creek, Woolwich September 15, 1915, *Fernald & Long*, no. 14826; above tide-limit at edge of marsh and among sedges and rushes of salt marsh, Winnegance Creek, Phippsburg, August 23, 1909, *M. L. Fernald*, nos. 2248 and 2249 (TYPE in Herb. New England Bot. Club); stony beach, tidal shores of the Kennebec River, Gardiner, September 18, 1923, *N. C. Fassett*, no. 884; tidal shores of the Kennebec River, West Woolwich, September 8, 1924, *N. C. Fassett*, no. 2106; tidal shores of the Kennebec River, Richmond Campground, September 16, 1924, *N. C. Fassett*, no. 2129; Cow Island, Topsham, August, 1910, *Kate Furbish*; bank of Androscoggin River, Brunswick, August 13, 1911, *C. H. Bissell*; Brunswick, August 22, 1911, *R. A. Ware*, no. 4230; tidal shores of the Mousam River, Kennebunk, September 22, 1923, *N. C. Fassett*, no. 895; Kennebunk, August 15, 1924, *N. C. Fassett*, no. 2114. NEW HAMPSHIRE: tidal shores of the Salmon Falls River, Salmon Falls, September 22, 1923, *N. C. Fassett*, no. 794. MASSACHUSETTS: brackish muddy shore [of Merrimac River], Newburyport, October 2,

1902, *Eaton & Fernald*; tidal shores, Mill Creek, Rowley, September 22, 1923, *N. C. Fassett*, no. 789; Rowley, August 15, 1924, *N. C. Fassett*, no. 2113.

B. HYPERBOREA, var. CATHANCENSIS Fernald, l. c. Estuary of the Kennebec River, and other rivers of this estuarine system.—MAINE: tidal mudflats of Cathance River, Bowdoinham, September 14 and 19, 1916, *Fernald & Long*, nos. 14825, 14827 (TYPE in Gray Herb.), 14828, also in *Pl. Exsicc. Gray*, no. 295; tidal shores, mouth of West Branch, Bowdoinham, August, 1921, *N. C. Fassett*, no. 911; tidal shores of Merrymeeting Bay, Bowdoinham, August 23, 1921, *N. C. Fassett*, no. 910; tidal shores of the Kennebec River, East Bowdoinham, August 24, 1921, *N. C. Fassett*, no. 160; tidal shores at the mouth of Eastern River, Dresden, September 13, 1924, *N. C. Fassett*, no. 2121; tidal shores, Kennebec River, Hatch's Corner, Dresden, September 9, 1924, *N. C. Fassett*, no. 2117.

B. HYPERBOREA, var. **laurentiana**, n. var., planta 1–3 dm. alta subsimplex ramis ascendentibus supra vel ramis tenuibus infra; foliis lanceolatis non attenuatis primariis 3–11 cm. longis, dentibus utrinque 1–5 obtusis plerumque grossis; bracteis involucri exterioribus 3–6 lanceolatis obtusis 1–3.5(–4.5) cm. longis 1.5–5(–8) mm. latis, plerumque integris rare dentibus utrinque 1–2; achaeniis exterioribus 7–8 mm. longis, interioribus 8–10 mm. longis aristis marginalibus 3.5–4 mm. longis.

Plant 1–3 dm. tall, subsimple, with ascending branches above, sometimes with weak ascending branches below: leaves of the primary stem 3–11 cm. long, ascending, lanceolate, not attenuate, with 1–3 pairs of blunt, usually coarse, teeth: outer involucre bracts 3–6, lanceolate, obtuse at tip, 1–3.5(–4.5) cm. long, 1.5–5(–8) mm. broad, usually entire, the largest rarely with 1–2 pairs of teeth: outer achenes 7–8 mm. long; inner achenes 8–10 mm. long; awns 4, the outer pair 3.5–4 mm. long.—ESTUARY OF THE ST. LAWRENCE RIVER, and perhaps on estuaries from Chaleur Bay to Northumberland Strait, New Brunswick.—QUEBEC: Cap-Rouge, un peu plus haut que le Pont de Québec. Rivages sur la zone intercotidale, avec *Gentiana Victorinii*, 29 août 1922, *Fr. M.-Victorin*, no. 15461 (TYPE in Gray Herb.); grèves de Beauport, près de Québec. Sur la zone intercotidale, 6 août 1922, *Fr. Rolland*, no. 15460; Saint-François de l'Isle d'Orléans, rivages, sur la zone intercotidale, 24 août 1922, *Fr. M.-Victorin*, no. 15459; tidal flats of the St. Lawrence River, St. Jean-Port-Joli, August 10, 1923, *Svenson & Fassett*, no. 912; muddy tidal shore of the Boyer River, St. Vallier, August 9, 1923, *Svenson & Fassett*, no. 855.—The following collections are mostly immature, but seem best treated with this variety. QUEBEC: brackish shore, submerged at high tide, alluvial islands at the mouth of the Bonaventure River, August 4, 1904, *Collins, Fernald & Pease*; dead waters, between Baldé and the Baie des Chaleurs, August 5, 6 and 8, 1904, *Collins, Fernald & Pease*, no. 5871. NEW BRUNSWICK: tidal flats of the Restigouche

River, Head of Tide, August 16, 1923, *Svenson & Fassett*, nos. 893, 897 and 898; tidal shores of Eel River, Dalhousie, August 16, 1923, *Svenson & Fassett*, no. 882; estuary of the Jacquet River, Durham, August 17, 1923, *Svenson & Fassett*, no. 819; tidal flats of the Teta-gouche River, Bathurst, August 17, 1923, *Svenson & Fassett*, no. 887; tidal shores of the Tabusintac River, Almwick, August 18, 1923, *Svenson & Fassett*, no. 883; tidal shores of the Miramichi River, Newcastle, August 19, 1923, *Svenson & Fassett*, no. 896; tidal flats of the Miramichi River 5 miles above Newcastle, August 19, 1923, *Svenson & Fassett*, no. 846; tidal flats of the Kouchibouguac River, Charleton, August 20, 1923, *Svenson & Fassett*, no. 888; tidal shores of the Kouchibouguacis River, Bretagne, August 20, 1923, *Svenson & Fassett*, no. 886.

B. HYPERBOREA, var. **Svensoni**, n. var., planta 1-2.5 dm. alta ramis imis arcuato-ascendentibus var. *gaspensem* simulans vel subsimplex; foliis extendentibus ascendentibusve obtusis, dentibus utrinque 1-3 grossis obtusis; bracteis involucris exterioribus (2-)3-4, lanceolatis obtusis utrinque cum dentibus obtusis 1, rare 2 instructis; bracteis interioribus 7-9 mm. longis ad apicem subrotundis; achaeniis exterioribus 6 mm. longis, interioribus 8 mm. longis, aristis marginalibus 2.5-3 mm. longis.

Plant 1-2.5 dm. tall, with arcuate lower branches as in var. *gaspensis* or sometimes subsimple: leaves of the primary stem 4-6 cm. long, spreading or ascending, blunt at tip, with 1-3 pairs of coarse teeth: outer involueral bracts (2-)3-4, lanceolate, obtuse at tip, with 1, rarely 2, pairs of teeth; inner bracts 7-9 mm. long, somewhat rounded at the tip: outer achenes 6 mm. long; inner achenes 8 mm. long; awns 4, the outer pair 2.5-3 mm. long.—QUEBEC: tidal shores, Rimouski River, Rimouski, August 14, 1923, *Svenson & Fassett*, nos. 936 (TYPE in Gray Herb.) and 899.

Intermediate between varieties *gaspensis* and *laurentiana*. The former it approaches in its usually much branched habit, but differs in the texture and tothing of the leaves and outer involueral bracts. In these it approaches, but does not simulate, var. *laurentiana*.

Named for Mr. H. K. Svenson, whose good companionship and persistence in the face of trying circumstances did much to make the collecting trip of 1923 a successful one.

B. HYPERBOREA, var. *GASPENSIS* Fernald, RHODORA xx. 150 (1918). QUEBEC: brackish shores, submerged at high tide, mouth of the St. John River, Douglstown, August 23, 1904, *Collins, Fernald & Pease*; submerged at high tide, brackish shores about the mouth of Dartmouth River, August 26 and 27, 1904, *Collins, Fernald & Pease*.

B. HYPERBOREA, var. *ARCUANS* Fernald, RHODORA xxv. 44 (1923). Known from only one collection, in NEW BRUNSWICK, tidal mud of the Miramichi River, Newcastle, July 30, 1922, *Fernald & Pease*, no. 25321. Svenson and Fassett, collecting on the estuary of the Miramichi River the year after this variety had been discovered,

found no specimens matching those collected by Fernald and Pease. The latter two collected farther down the river than did the former, hence in more brackish water, so it may be that this variety is more tolerant of salinity than is var. *laurentiana*. Var. *arcuans* must be earlier in its flowering than is var. *laurentiana*, for satisfactory fruiting material of the latter can hardly be found in the middle of August, while the former, collected on July 30, had some mature achenes in the heads.

BIDENS cernua × **hyperborea**, var. **colpophila**, *hyb. nov.*, planta 1.5–3 dm. alta subsimplex vel cum ramis tenuibus infra munitis; foliis primariis 5–8 cm. longis extendentibus subascendentibusve attenuatis, dentibus acutis utrinque 1–6; capitulis campanulatis vel hemisphaericis ad anthesem erectis; bracteis involucri exterioribus 4–5, extendentibus vel ascendentibus 1–2 cm. longis; achaeniis curvatis in costis prominentibus marginibus suberosis substriatulis.

Plant 1.5–3 dm. tall, subsimple or with weak branches below: leaves of the primary stem 5–8 cm. long, spreading or subascending, attenuate, with 1–6 pairs of sharp teeth: heads campanulate to hemispherical, erect in anthesis; outer involucre bracts 4–5, spreading to ascending, 1–2 cm. long: achenes curved, with prominent midribs and corky margins, obscurely striate.—With the habit of *B. hyperborea*, and the achenes of *B. cernua*.—MAINE: Nonesuch River, Scarborough, September 25, 1924, Norton, Welden & Haren (TYPE in Gray Herb.); Nonesuch River, Scarborough, August 20, 1919, A. H. Norton.

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ERYSIMUM Pallasii (Pursh), n. comb.—*Cheiranthus Pallasii* Pursh, Fl. Am. Sept. ii. 436 (1814). *C. pygmaeus* Adams, Mém. Soc. Nat. Mosc. v. 114 (1817). *Hesperis pygmaea* (Pursh) Hook. Fl. Bor.-Am. i. 60, t. 90 (1830). *H. minima* T. & G. Fl. N. A. i. 90 (1838). *H. Hookeri* Ledeb. Fl. Ross. i. 174 (1841). *Erysimum pygmaeum* (Adams) Gay, Erys. Nov. 4 (1842). *Hesp. Pallasii* (Pursh) Seem. Bot. Herald, 24 (1852). *Sisymbrium pygmaeum* (Pursh) Trautv. Act. Hort. Petrop. i. 60 (1871).

This beautiful purple-flowered arctic species has recently been known as *Erysimum pygmaeum* or by those who merge it with *Hesperis* as *H. Pallasii*. The latter combination is generally ascribed to Torrey & Gray, who certainly did not make it. They called it *Hesperis minima*, but added the note: "Sir William Hooker is inclined to refer to this species *Cheiranthus Pallasii*, Pursh, If his suspicion is confirmed, Pursh's specific name must be adopted."—M. L. FERNALD, Gray Herbarium.